Common species name	Latin species name	Source	Coriell number (if applicable)	MLS (yrs)	Age	Passage Number	Sup Fig. 1A	SupFig. 1B	Fig. 1	Fig. 2	Sup Fig. 3	Fig. 3A, B	Fig. 3C	Fig. 3F	Fig. 4A, B	Fig. 4C	Fig. S8	Fig. 5A-C
Common Marmoset	Callithrix jacchus	In-house (1 line)	-	16.5	3	4-10	х	х	х			x	х	х		х	х	х
Southern Lesser Bushbaby	Galago moholi	Coriell	PR00519	16.6	8	16	x	x	x	x			x	x				
Coquerel's Mouse Lemur	Mizra coquereli	Coriell	PR01044	17.4	11	12			х	х		х		х		х		
Pygmy Marmoset	Callithrix pygmaea	Coriell	PR00839	18.6	5	8-11	х	х			х	х		х		х	х	X
Pygmy Marmoset	Callithrix pygmaea	Coriell	PR00644	18.6	6	6					х			х				
Red-bellied Lemur	Eulemur rubriventer	Coriell	PR00273	20	7	7-11		х	х	х		х	х	х		х	х	х
Red Tamarin	Saguinus midas	Coriell	PR00550	20.5	5	7-15	х	х	х	х		х	х	х		х		
Noisy Douroucouli	Aotus vociferans	Coriell	PR00636	22.1	16	7-8		х			х	х	х	х		х	х	х
L'Hoest's Monkey	Cercopithecus lhoesti	Coriell	PR01126	24.1	2	11-13	х	х	х	х	х	х	х	х		х	х	Х
Red Titi	Callicebus cupreus	Coriell	PR00793	26.4	6	8-13	х	х	х		х	x	х	х		х	х	X
Olive Baboon	Papio anubis	Coriell	PR00033	27.5	3	5-11	х	х	х	х	х		х	х	х		х	х
Patas Monkey	Erythrocebus patas	Coriell	AG06254	28.3	20	9								х				
Squirrel Monkey	Saimiri sciureus	Coriell	PR00612	30.2	6	10-11	x	x	x	x	x	x		x		x	x	x
White (Verreaux's) Sifaka	Propithecus verreauxi	Coriell	PR00326	30.5	9	5			x			x				x		
Vervet	Chlorocebus aethiops	In-house (3 lines)	-	30.8	9 9 9	4-11 3-5 9	x	x	x	x	x	x	x	x	x	x	x	x
Common Woolly Monkey	Lagothrix lagotricha	Coriell	AG05356	32	17	15-20	х	х	х		х	х		х		х	х	x
Colobus Monkey	Colobus guereza	Coriell	PR00096	35	5	15								х				
Guianan Saki	Pithecia pithecia	Coriell	PR00239	36	9	11		х	х			х		х		х		
Ring-tailed Lemur	Lemur catta	Coriell	PR00126	37.3	9	14								х				
Hamadryas Baboon	Papio hamadryas	In-house (2 lines)	-	37.5	5 6	2-9 7	х	x	x	х	x	x	x	х	x	x	x	x
Cynomolgus	Macaca fascicularis	In-house (2 lines)	-	39	6 6	4-6 5-7		х	х		х	x	х	х	x	х		
Rhesus Macaque	Macaca mulatta	In-house (3 lines)	-	40	5 4 4	7 12-14 9	x	x	x		x	x			x	x	x	x
Mandrill	Mandrillus sphinx	Coriell	PR00399	40	12	6-15					х		х	х	х		x	X
Red-capped Mangabey	Cercocebus torquatus	Coriell	PR00485	46	8	12	х	х	х	х	х	х	х	х		х		
Bonobo	Pan paniscus	Coriell	PR00236	55	22	6-11	х	х	х	х	х	x		х	х	х	х	x
Bonobo	Pan paniscus	Coriell	PR00235	55	28	18-20									х		х	х
Gorilla	Gorilla gorilla	Coriell	PR00055	55.4	12	10-18	х	х	х		х	x	х	х		х	х	x
Gorilla	Gorilla gorilla	Coriell	PR00279	55.4	23	15-23	х	х	х	х	х	x	х	х	х	х	х	х
White-handed Gibbon	Hylobatus lar	Coriell	PR01131	56	5	7-10		х	х	х	х		х	х			х	х
Orangutan	Pongo pygmaeus	Coriell	PR01107	59	11	11-19	х	х	х	х	х	x	х	х	х	х	x	X
Chimpanzee	Pan troglodytes	Coriell	PR00175	59.4	12	13	х	х	x	х		x	x	х	x	х	x	x
Chimpanzee	Pan troglodytes	Coriell	PR00115	59.4	13	12-15			х		х	x	х		х	х		
Human	Homo sapiens	Coriell	GM03651	122.5	25	16	х	х	x			x		х	x	х		
Human	Homo sapiens	Coriell	GM01948	122.5	27	9					х			х			x	X
Human	Homo sapiens	Coriell	GM03652	122.5	24	16			x					х	х			

Supplemental Table 1. List of cell lines used

### Two-Way ANOVA

	PSMB8			Prote	asomal A	ctivity	PSMB5			
	df	F	Sig	df	F	Sig	df	F	Sig	
Rapamycin	1,12	80.230	<0.001	1,12	7.348	0.018	1,12	0.171	0.686	
Sex	1,12	29.709	<0.001	1,12	5.348	0.039	1,12	13.349	0.002	
Rapamycin x Sex	1,12	3.682	0.080	1,12	0.604	0.452	1,12	9.726	0.009	
Snell	1,20	9.140	0.007	1,20	1.834	0.191	1,20	12.530	0.020	
Sex	1,20	1.659	0.212	1,20	1.778	0.197	1,20	3.150	0.091	
Snell × Sex	1,20	0.670	0.423	1,20	2.280	0.147	1,20	4.151	0.055	
17-α-Estradiol	1,12	11.291	0.006	1,12	2.742	0.124	1,12	3.952	0.070	
Sex	1,12	64.941	<0.001	1,12	1.443	0.253	1,12	21.076	0.001	
$17-\alpha$ -Estradiol $\times$ Sex	1,12	0.111	0.745	1,12	1.167	0.301	1,12	0.363	0.558	
NDGA	1,44	14.214	<0.001	1,44	10.408	0.002	1,12	0.051	0.825	
Sex	1,44	17.966	<0.001	1,44	16.499	<0.001	1,12	1.547	0.237	
NDGA x Sex	1,44	4.699	0.036	1,44	6.988	0.011	1,12	1.070	0.321	

#### Least Significant Difference Post-Hoc Test

			PSMB8			Proteasomal Activity			PSMB5			
			Mean Diferenc	Std. Error	Sig	Mean Diferenc	Std. Error	Sig	Mean Diference	Std. Error	Sig	
i.	Male Control	Male Drug	+67.7	27.1	0.029	+22.4	16.1	0.189	-28.2	11.3	0.028	
۵Å	Male Control	Female Control	+135	27.1	<0.001	+17.5	16.1	0.299	-54.0	11.3	0.299	
apai	Female Contro	I Female Drug	+141	27.1	<0.001	+40.1	16.1	0.028	+21.6	11.1	0.08	
œ	Male Drug	Female Drug	+67.7	27.1	<0.001	+35.2	16.1	0.049	-4.27	11.1	0.712	
	Male Control	Male Snell	+87.4	32.2	0.013	+51.3	25.3	0.056	+233	59.3	0.001	
	Male Control	Female Control	+47.9	32.2	0.152	+51.0	25.3	0.058	+11.0	59.3	0.855	
l s	Female Contro	I Female Snell	+50.1	32.2	0.135	-2.79	25.3	0.913	+63.0	59.3	0.301	
	Male Snell	Female Snell	+10.7	32.2	0.743	-3.16	25.3	0.902	+159	59.3	0.014	
diol	Male Control	Male Drug	+67.7	22.6	0.023	+21.0	10.8	0.08	-26.9	14.7	0.092	
stra	Male Control	Female Control	+135	22.6	<0.001	+17.5	10.8	0.133	-54.0	14.7	0.003	
μü	Female Contro	I Female Drug	+48.3	22.6	0.054	+4.42	10.8	0.691	-14.4	14.7	0.346	
-11	Male Drug	Female Drug	+124	22.6	<0.001	-0.93	10.8	0.933	41.5	14.7	0.015	
	Male Control	Male Drug	+358	141	0.014	+46.5	11.2	<0.001	+45.7	51.3	0.390	
8	Male Control	Female Control	+92.3	141	0.515	-11.2	11.2	0.321	-7.60	51.3	0.885	
<del>2</del>	Female Contro	I Female Drug	+504	141	0.001	+4.61	11.2	0.682	-29.3	51.3	0.578	
	Male Drug	Female Drug	-239	141	0.096	-53.2	11.2	<0.001	-82.6	51.3	0.133	

Supplemental Table 2. Two way ANOVA and post-hoc analyses for mouse liver tissue



**Supplemental Figure 1.** Proteolytic activity in fibroblast lysates increases with lifespan among species of primates. (A) Scatterplot of Suc-LLVY-AMC degradation during incubation with cell lysate from different primate species in the absence of ATP. (B) Scatterplot of Suc-LLVY-AMC degradation in lysates supplemented with 0.25mM ATP. Error bars if present represent the SEM of two cell lines derived from independent animals. MLS = Maximum Species Lifespan in years. Response from one cell-line of human fibroblasts is shown with an "H", but is not included in statistical analysis.



**Supplemental Figure 2.** Fibroblasts from longer lived species of primates have greater 20S proteasome activity **(A-D)** Scatterplots of 4 independent experiments using different independent sets of primate species. Proteasome activity measured in a Native polyacrylamide gel using an in-gel overlay by Suc-LLVY-AMC. **(E)** Combined data from the 4 scatterplots. **(F)** Re-plot of Figure 1B in which three outliers (shown with arrows in panel E) were removed. Removal of these datapoints does not change any of the conclusions drawn from this data. Results for human cell-lines are shown with an "H" but are not included in statistical analysis.



Supplemental Figure 3. Fibroblasts from longer lived species of primates have a significant elevation in PSMB8 levels but no significant lifespan association in levels of PSMB5. (A) Representative immunoblot. Samples were run on a SDS polyacrylamide gel, and then developed using antibodies against PSMB5 (standard proteasome specific subunit), PSMB8 (immunoproteasome specific subunit) or PSMB4 as a measure of total proteasome. (B) Scatterplot of PSMB5 level adjusted to total protein. (C) Scatterplot of PSMB5 level adjusted to PSMB4 level adjusted to total protein. (E) Scatterplot of PSMB8 level adjusted to PSMB4. Error bars if present represent the SEM of 2 cell lines derived from independent animals. MLS = Maximum lifespan in years.

The Red-capped Mangabey (indicated with an arrow) was considered an outlier in panels A & B. Removal of this datepoint did not change the conclusions of these panels. With the removal of the Red-capped Mangabey no significant correlation was observed between PSMB5 and lifespan in either panel A ( $R^2 = 0.01 p = 0.74$ ) or panel B ( $R^2 = 0.01 p = 0.69$ ).

Protein	PSMB5	PSMB8	PSMB4	
Antibody name:	ab3330	ab3329	ab166792	
Epitope:	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Marmoset (mls 16.5)	IRVSSDNVADLHEKYS	NVSDLLHRYREA	QIATVTEKGVE	
Galago (mls 18.3)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYWEA	QIATVTEKGVE	
Olive baboon (mls 27.5)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Squirrel Monkey (mls30.2)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Cynomolgus (mls 39)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Rhesus Macaque (mls 40)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Gibbon (mls 44.1)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Bonobo (mls 55)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Gorilla (mls 55.4)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Orangutan (mls 59)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYQEA	QIATVTEKGVE	
Chimpanzee (mls 59.4)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	
Human (mls 122.5)	IRVSSDNVADLHEKYS	ESTDVSDLLHQYREA	QIATVTEKGVE	



**Supplemental Figure 4. (A)** Antibody binding epitope based on NCBI sequence data. **(B)** Custom peptide sequences were produced by thermo scientific. Peptides were subjected to a direct ELISA assay and screened by an antibody to PSMB8. Binding was quantified using a TMB substrate

# *PSMB5* partial mRNA sequence

to tcaggggccacattotctgtaggttotggctctgtgtatgcgtatggggtcatggatc

 ${\tt tctcaggggccaccttctctgtaggttctggctctgtgtatgcttatggagtcatggatc}$ 

	Forward Frimer		
Human	attaaccottacctgottggcaccatgtctggctgtgcagcagactgtcagtactgggag	Human	ggcaatgtcgaatctatgagcttcgaaataaggaacgcatctctgtagcagctgcctcca
Bonobo	attaaccett <mark>acetgettggcaccatgt</mark> etggetetgeageagaetgteagtaetgggag	Gorilla	ggcaatgtcgaatctatgagcttcgaaataaggaacgcatctctgtagcagctgcctcca
Chimpanzee	attaaccett <mark>acetgettggeaceatgt</mark> etggetetgeageagaetgteagtaetgggag	Chimpanzee	ggcaatgtcgaatctatgagcttcgaaataaggaacgcatctctgtagcagctgcctcca
Orangutan	attaaccett <mark>acetgettggeaceatgt</mark> etggetgtgeageagaetgteagtaetgggag	Bonobo	ggcaatgtcgaatctatgagcttcgaaataaggaacgcatctctgtagcagctgcctcca
Cynomolgus	attaaccettacetgettggcaccatgtotggetgtgcagcagactgtcagtactgggag	Gibbon	ggcaatgtcgaatctatgaacttcgaaataaggaacgcatctctgtagcagctgcctcca
Gorilla	attaaccettacetgettggcaccatgtetggcegcagcagaetgteagtaetgggag	Rhesus macaque	ggcaatgtcgaatctatgagettcgaaataaggaacgcatetetgtagcagetgeeteca
Baboon	attaaccettacetgettggeaceatgtetggetgtgeageageagaetgteagtactgggag	Baboon	accestationeetotetaaacttoreeeteeaaateeacetototateaceaactacotoce
Vervet		Vervet	ggoda ty coga to ta ty ago to to ty ago to to to ta ta ago ago ta ago to ta ago ago ta
Galago	attaaccettacetgettggcaccatgtctggctgtgcagcggactgtcagtactgggag	Orangutan	
Marmoset	attaaccett <mark>acetgettggcaccatgt</mark> etggttgtgcagcagaetgteagtaetgggag	Orangucan	ggcaatgtegaatetatgagettegaataaggaacgeatetetgtageagetgeeteea
	********	Marmoset	ggcaatgtcgaatctatgagcttcgcaataaggaacgcatctctgtagcagctgcctcca
		Galago	gtcaatgtcgaatctatgagctccgaaataaggagcgcatctctgtagcagctgcctcta
Human	cgcctgctggccaaggaatgcaggctgtactatctgcgaaatggagaacgtatttcagtg		* ********.****************************
Bonobo	cgcctgctggccaaggaatgcaggctgtactatctgcgaaatggagaacgtatttcagtg		Forward Primer
Orangutan	cgcctgctggccaaagaatgcaggctgtactatctgcgaaatggagaacgtatttcagtg		<b>_</b>
Cynomolous		Human	aactgcttgccaacatggtgtatca <mark>gtacaaaggcatggggctgt</mark> ccatgggcaccatga
Gorilla	cgcctgctggccaaggaatgcaggctgtactatctgcgaaatggagaacgtatttcagtg	Gorilla	aactgcttgccaacatggtgtatca <mark>gtacaaaggcatggggctgt</mark> ccatgggcaccatga
Gibbon	cgcctgctggccaaggaatgcaggctgtactatctgcgaaatggagaacgtatttcagtg	Chimpanzee	aactgcttgccaacatggtgtatcagtacaaaggcatggggctgtccatgggcaccatga
Baboon	cgcctgctggccaaggaatgcaggctgtactatttgcgaaatggagatcgtatttcggtg	Bonobo	aactgettgecaacatggtgtateagtacaaaggcatggggetgtecatgggcaccatga
Vervet	$\verb+cgcctgctggccaaggaatgcaggctgtactatctgcgaaatggagatcgtatttcagtg$	Gibbon	aactgettgecaacatggtgtateagtacaaaggeatggggetgtecatggggeaceatga
Galago	cgtctgttggccaaggagtgtaggctgtactatctgcggaatggggagcgcatctccgtc	Rhesus macaque	a ctacttaccascatatatatataca
Marmoset	cgcctgctggccaaggaatgcaggctgtactatctgcggaatggagaacgcatttcagtg	Paboon	a a ctige ctige caaca tigg tig ta toag ta caadag ca tigg go tig to ca tigg go a cta tig
	**.***.*********.**.**.**.***.*********	Vernet	a a ctyc ttyc ca ca tyg tyta tca y ta ca a a gy ca tyg y ca ca a tyg y tyg y ca ca a tyg y tyg y ca ca a tyg y tyg y ca ca t
Human		Vervec	aactgettgecaacatggtgtatcagtacaaggcatggggetgtecatgggeaceatga
Bonobo		Orangutan	aactgettgecaacatggtgtateagtacaaaggeatggggetgtecatgggeaceatga
Chimpanzee	tcggcagcctccaagctgctgtccaacatgatgtgccagtaccggggcatgggcctctct	Marmoset	agetgettgecaacatggtgtatcagtacaaaggcatggggetgtecatgggcaccatga
Orangutan	teggeageeteeaagetgetgteeaacatgatgtgeeagtaeeggggeatgggeetetet	Galago	aactgcttgccaatatggtgtatca <mark>gtacaaaggcatggggctgt</mark> ccatgggcaccatga
Cynomolgus	tcggcagcctccaagctgctgtccaacatgatgtgccagtaccggggcatgggcctctct		*.*************************************
Gorilla	teggeagectecaagetgetgtecaacatgatgtgecagtaceggggeatgggectetet		
Gibbon	toggcagcctccaagctgctgtccaacatgatgtgccagtaccggggcatgggcctctct		
Baboon	tcggcagcetecaagetgetgtecaacatgatgtgccagtaceggggcatgggeetetet	Human	tctgtggctggg <mark>ataagagaggccctggcct</mark> ctactacgtggacagtgaagggaaccgga
Calago	toggcagcetecaagetgetgtecaacatgatgtgccagtacogggggcatgggcetetet	Gorilla	tctgtggctgggataagagggcccaggcctctactacgtggacagtgaagggaaccgga
Marmoset		Chimpanzee	tctgtggctgggataagagggccctggcctctactacgtggacagtgaagggaaccgga
	** ****	Bonobo	
		Gibbon	
Human	${\tt atgggcagtatgatctgtggctgggataagaagggtcctggactctactacgtggatgaa$	Phoesis magazie	totatagotaga
Bonobo	$\verb+atgggcagcatgatctgtggctgggataagaagggtcctggactctactacgtggatcaa$	Riesus macaque	
Chimpanzee	atgggcagcatgatctgtggctgggataagaagggtcctggactctactacgtggatgaa	Baboon	
Orangutan	atgggcagtatgatctgtggctgggataagaagggtcctggactctactacgtgaatgaa	vervet	totgtggotgggataagagaggcootggcotctactacgtggacagtgaagggaaccgga
Cynomolgus	atgggcagcatgatctgtggctgggataagaagggtcctggactctactacgtggatgaa	Orangutan	tetgtggetgggataagagaggeeetggeetetaetaegtggaeagtgaagggaacegga
Gibbon	a tygg cag ta tgatetg tgg etg gga ta aga agg gg tee tyga ete ta eta eta eta eta eta eta eta eta	Marmoset	tctgtggctggg <mark>ataagagaggccctggcct</mark> ctactacgtggacagtgaagggaaccgga
Baboon	atgggcagcatgatctgtggctgggataagaagggtcctggactctactacgtggatgaa	Galago	tctgtggctggg <mark>ataagagggccctggcct</mark> ctactatgtggatagtgaagggaaccgga
Vervet	atgggcagtatgatctgtggttgggataagaagggtcctggactctactacgtggatgaa		**************************************
Galago	atgggcagtatgatctgtggctgggacaagaagggtcctggactctactatgtaaatgaa		Reverse Primer
Marmoset	atgggcagtatgatctgtggctgggataagaagggtcctggactctactatgtggatgaa		
	**.****.************.****.****	Human	tttcaggggccaccttctctgtaggttctggctctgtgtatgcatatggggtcatggatc
		Gorilla	tttcaggggccaccttctctgtaggttctggctctgtgtatgcgtatggggtcatggatc
Human	catgggactcggctctcaggaaatatgttctccacgggtagtgggaacacttatgcctac	Chimpanzee	tttcaggggccacettetetgtaggttetggetetgtgtatgggtatgggteatggate
Chimpanzee		Bonobo	tt to agggg cooct to tot aggt to tagget o tata tagggt co tagget co
Orangutan	cacgggac toggetetcaggaaa tatg tto tocac tog tag tag tgggaacgetta tgeetac	Gibbon	tt to a gage ta contrat of at a gat to tage tage to tage tage to tage tage to tage tage tage tage tage tage tage tage
Cynomolgus	catgggactcggctctcaggaaatatgttctccactggtagtgggaacacttatgcctac	Phoene magazio	to to a gagge cace the total aget to taget a t
Gorilla	catgggactcggctctcaggaaatatgttctccacgggtagtgggaacacttatgcctac	Riesus macaque	
Gibbon	catgggactcg <mark>gctctcaggaaatatgttctccac</mark> tggtagtgggaacacttatgcctac	Baboon	to toag ggggeeace ttototgtaggt totggete tgtg ta tggggt Ca tgga to
Baboon	catgggactcg <mark>getetcaggaaatatgtteteeac</mark> tggtagtgggaacaettatgeetae	vervet	teteaggggeeacettetetgtaggttetggetetgtgtatgegtatggggteatggate
Vervet	catgggactcg <mark>gctctcaggaaatatgttctccac</mark> tggtagtgggaacacttatgcctac	Orangutan	tttcaggggccaccttctctgtaggttctggctctgtgtatgcgtatggggtcatggatc

Reverse Primer

aatggaactcggctctcaggaaatatgttctccactggtagtgggaacacttatgcctat

aatgggactcggctctcaggaaatatgttctccactggtagtgggaacacttatgcctac

*PSMB8* partial mRNA sequence

Galago

Marmoset

Supplemental Figure 5. PSMB8 and PSMB5 primer sequences. Sequence homology was determined through comparisons of primate sequences available on NCBI. These included: Humans (Homo sapiens), Gorilla (Gorilla gorilla), Chimpanzee (Pan trogloytes), Bonobo (Pan paniscus), Orangutan (Pongo abelii), Gibbon (Hylobatus leucogenys), Rhesus macague (Macaca mulatta), Cynomolgus (Macaca fascicularis), Baboon (Papio anubis), Squirrel monkey (Saimiri boliviensis), Vervet (Chlorocebus sabaeus), Marmoset (Callithrix jacchus) and Galago (Otolemur garnettii). The set of species for which mRNA data was available was not consistent between genes. The Tarsier (Tarsius syrichta) sequence was not included as none of the primate species assayed in this paper were found on that branch of the primate phylogeny. The "\*" symbol was used to represent nucleotides that are completely conserved between the species assayed.

Marmoset

Galago



Supplemental Figure 6. Scatterplot of  $H_2O_2$  dose required to reduce cell viability to 50%  $\pm$  IFN- $\gamma$ 

		IFNGR2 antibody (ab175878) epitope
Family	Species	DSSPKDDVWDSVSIISFPEKEQEDVLQTL
Galagonidae	Galago (mls 18.3)	NNSPKDDAWDSVFIVSFPEKEHEHVLQTL
Pitheciidae	Red-bellied Titi (mls 26.4)	DSSPKDDVWDSVSIIS <mark>L</mark> PEK <mark>G</mark> QEDVLQT
Cercopithecidae	Olive Baboon (mls 27.5)	DSSPKDDVWDSVSIISFPEKEQEDVLQTL
Cercopithecidae	Vervet (mls 30.8)	DSSPKDDVWDSVSIISFPEKEQEDVLRTL
Cebidae	Squirrel Monkey (mls30.2)	DSSPKDDVWDSVSIILFPEKEQEDVLQT
Cercopithecidae	Cynomolgus (mls 39)	DSSPKDDVWDSVSIISFPEKEQDDVLQTL
Cercopithecidae	Rhesus Macaque (mls 40)	DSSPKDDVWDSVSIISFPEKEQDDVLQTL
Hominidae	Bonobo (mls 55)	DSSPKDDVWDSVSIISFPEKEQEDVLQTL
Hominidae	Orangutan (mls 59)	DSSPKDDVWDSVSIISFPEKEQEDVLQTL
Hominidae	Chimpanzee (mls 59.4)	DSSPKDDVWDSVSIISFPEKEQEDVLQTL
Hominidae	Human (mls 122.5)	DSSPKDDVWDSVSIISFPEKEQEDVLQTL



**Supplemental Figure 7. (A)** Antibody binding epitope based on NCBI sequence data. **(B)** Custom peptide sequences were produced by Thermo Scientific. Antibody binding affinity for New World monkeys and Galagos (not shown) was very different from that of Old World monkeys, Baboons and Great Apes as a result these groups were not used in measurements of IFNGR2. Peptides were subjected to a direct ELISA assay and screened by an antibody to IFNGR2. Binding was quantified using a TMB substrate.

B

## IFNGR2 partial sequence

#### Forward Primer

Human	ctgtacaacgcagagcaggtcctgagttgggagccagtggccctgagcaatagcacgagg
Chimpanzee	ctgtacaacgcagagcaggtcctgagttgggagccagtggccctgagcaatagcacgagg
Vervet	ctgtacaacgcagagcaggtcctgagttgggagccagtggccctgagcaatagcacaagg
Baboon	ctgtacaatgcagagcaggtcctgagttgggagcctgtggccctgagcaatagcacaagg
Cynomolgus	ctgtacaacgcagagcaggtcctgagttgggagccggtggccctgagcaatagcacaagg
Orangutan	ctgtacaacgcagagcaggtcctgagttgggagccagtggccctgagcaatagcacgagg
Bonobo	ctgtacaacgcagagcaggtcctgagttgggagccagtggccctgagcaatagcacgagg
Rhesus Macaque	ctgtacaacgcagagcaggtcctgagttgggagccggtggccctgagcaatagcacaagg
Squirrel Monkey	ctgnntaaggcagagcaggtcctgagttgttagccagtggccctgagcaatggcacgagg
Gorilla	ctgtacaacgcagagcaggtcctgagttgggagccagtggccctgagcaatagcacgagg
Galago	ctgtacaacgccaagcaggttctgagttgggagccagtggccctgagcaatgacacaagg
	*** .** ** .***************************
Human	cctgttgtctaccaagtgcagtttaaatacaccgacagtaaatggttcacggccgacatc
Chimpanzee	cctgttgtctaccgagtgcagtttaaatacaccgacagtaaatggttcatggccgacatc
Vervet	cctgttgtctaccgagtgcagtttaaatacaccgatagtgaatggttcatgaccgacatc
Baboon	cctgttgtctaccgagtgcagtttaaatacaccgatagtgaatggttcatgaccgacatc
Cynomolgus	cctgttgtctaccgagtgcagtttaaatacaccgatagtgaatggttcatgaccgacatc
Orangutan	cctgttgtctaccaagtgcagtttaaatacaccgacagtaaatggttcatggccgacatc
Bonobo	cctgttgtctaccgagtgcagtttaaatacaccgacagtaaatggttcatggccgacatc
Rhesus Macaque	cctgttgtctaccgagtgcagtttaaatacaccgatagtgaatggttcatgaccgacatc
Squirrel Monkey	cctgtggtctatcgggtgcagtttaaatacaccaacagtgaccggctcttggccgacatc
Gorilla	cctgttgtctaccgagtgcagtttaaatacaccaacagtaaatggttcatggccgacatc
Galago	ccggtggtctaccgggtacagtataaatacacatttagtgattggtccgacattgacatc
	** ** *****.*. ***** ******************
Human	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgccgcc}$
Chimpanzee	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgctgcc}$
Vervet	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgccgcc}$
Baboon	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgccgcc}$
Cynomolgus	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgccgcc}$
Orangutan	${\tt atgtccataggggtgaattgtacacagatcacaacaacagagtgtgacttcactgccgcc}$
Bonobo	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgctgcc}$
Rhesus Macaque	at gtccat aggggtgaattgtac acagatcac agcaac agagtgtgacttcactgccgcc
Squirrel Monkey	atgctcataggagtgagatgta
Gorilla	${\tt atgtccataggggtgaattgtacacagatcacagcaacagagtgtgacttcactgccacc}$
Galago	gtgggggtgaattgtacacaaatcacagtgacggaatgcgacttcactgcaagt
	.** **.***. ****
Human	agtccctcagcaggcttcccaatggatttcaatgtcactctacgccttcgagctgagctg
Chimpanzee	agtccctcagcaggettcccaatggatttcaatgtcactctacgccttcgagetgaget
Vervet	ageccetcageaggettcccaatggatttcaatgtcactetacgtettcgagetgaget
Baboon	ageccetcageaggettceceatggattteaatgtcactetacgtettegagetgaget
Cynomolgus	ageccetcageaggetteccaatggatttcaatgteactetgegtettegagetgaget
Orangutan	acttcctcagcaggettcccaatggatttcaatgtcactctacgccttcgagctgagctg
Bonobo	agtecetcageaggetteceaatggattteaatgteactetacgeettegagetg
Rhesus Macaque	ageccetcageaggetteccaatggattteaatgteactetgegtettegagetgaget
Squirrel Monkey	ctggcttccctatggatttcagagtcactctatgccttcgagctgagctg
Gorilla	agaccetcagcaggetteccaatggattteaatgteactetacgeettegagetgaget
Galago	ggcacetecaagggetteccaatggattttaatgteaetetgegeetteaagetgagetg
	** ******* ****************************
	Developed Buddeen

**Supplemental Figure 8.** *IFNGR2* primer sequence. Sequence homology was determined through comparisons of primate sequences available on NCBI. These included: Humans (*Homo sapiens*), Gorilla (*Gorilla gorilla*), Chimpanzee (*Pan trogloytes*), Bonobo (*Pan paniscus*), Orangutan (*Pongo abelii*), Gibbon (*Hylobatus leucogenys*), Rhesus Macaque (*Macaca mulatta*), Cynomolgus (*Macaca fascicularis*), Baboon (*Papio anubis*), Squirrel Monkey (*Saimiri boliviensis*), Vervet (*Chlorocebus sabaeus*), Marmoset (*Callithrix jacchus*) and Galago (*Otolemur garnettii*). The set of species for which mRNA data was available was not consistent between genes. The Tarsier (*Tarsius syrichta*) sequence was not included as none of the primate species assayed in this paper were found on that branch of the primate phylogeny. The "\*" symbol was used to represent nucleotides that are completely conserved between the species assayed.



**Supplemental Figure 9.** Fibroblasts from longer lived species of primates have increased mRNA expression of STAT1 but no significant association to lifespan in mRNA expression for IFNGR1 or JAK1. (A) Scatterplot of relative STAT1 mRNA levels. (B) Scatterplot of relative IFNGR1 mRNA levels. (C) Scatterplot of relative JAK1 mRNA levels. Error bars if present represent the SEM of 2 cell lines derived from independent animals .

# TAP2 partial mRNA sequence

## TAP1 partial mRNA sequence

#### Forward Primer

Human	ccagacaggtaacatcatgt <mark>ctcgggtaacagaggacac</mark> gtccaccctgagtgattctct	ccttctgcccaagaaggtgggaaaatggtaccagttgctggaagtgcaggtgcgggaatc	Human	$a \verb+aattccaagacgtctcctttgcatatcccaatcgccctgacaggcctgtgctcaagggggggg$
Gorilla	ccaaacaggtaacatcacgtctcgggtaacagaggacacgtccaccctgagtgattctct	ccttctgcccaagaaggtgggaaaatggtaccagttgctggaagtgcaggtgcgggaatc	Gorilla	aaattecaagaegteteetttgeatateceaategeeetgaeaggeetgtgeteaagggg
Bonobo	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> gtccaccctgagtgattctct	ccttctgcccaagaaggtgggaaaatggtaccagttgctggaagtgcaggtacgggaatc	Bonobo	aaattccaagacgtctcctttgcatatcccaatcgccccgacaggcctgtgctcaagggg
Chimpanzee	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> gtccaccctgagtgattctct	ccttctgcccaagaaggtgggaaaatggtaccagttgctggaagtgcaggtgcgggaatc	Orangutan	aaattccaagatgtctcctttgcatatcccaatcgccccgacaggcctgtgctcaagggg
Orangutan	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> gtccaccctgagtgattctct	ccttctgcccaagaaggtcggaaaatggtaccagttgctggaagtgcaggtgcgggaatc	Baboon	aaattccaagacgtctcctttgcatatcccaatcgccccgacaggcctgtgctcaaggg
Gibbon	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> gtccgccctgagtgattctct	ccttctgcccaagaaggtgggaaagtggtaccagttgctggaagtgcaggtgcgggactc	Cynomolgus	aaattecaagaegteteetttgeatateeeaategeeeegaeaggeetgtgeteaagggg
Cynomolgus	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> ttccgccctgagtgatgctct	ccttctgcccaagaaggtgggaaaatggtatcagttgttggcagtgcaggtgcgggaatc	Vervet	a a atteca a gacg teteetttg ca ta tececa tegeceega cagge etg tg etca aggggggggggggggggggggggggggggggggggg
Rhesus Macaque	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> ttccaccctgagtgatgctct	cottetgeccaagaaggtgggaaaatggtatcagttgttggcagtgcaggtgcaggaate	Rhesus Macaque	aaattccaagacgtctcctttgcatatccatatcgccccgacaggcctgtgctcaagggg
Vervet	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> ttctgccctgagtgatgctct	ccttctgcccaagaaggtgggaaaatggtatcagttgctggcagtgcaggtgcgggaatc	Gibbon	aaattccaagatgtctcctttgcatatcccaattgccccgacaggcctgtgctcaagggg
Baboon	ccaaacaggtaacatcacgt <mark>ctcgggtaacagaggacac</mark> ttccgtcctgagtgatgctct	ccttctgcccaagaaggtgggaaaatggtatcagttgctggcagtgcaggtgcgggaatc	Chimpanzee	aaattecaagaegteteetttgcatateccaategeecegaeaggeetgtgeteaagggg
Marmoset	ccaaacaggtaccatcgcgt <mark>ctcgggtaacagaggacac</mark> atccaccctgagtgggtctct	ccttctgcccaagaagctgggaaaatggtaccagttgctgggagtgcaggtgcaggaatc	Squirrel Monkey	aagttccaagacgtctcctttgcatatcccaatcgcccggacaagcctgtgctcaagggg
Squirrel Monkey	ccaaacaggtaccatcacgt <mark>ctcgggtaacagaggacac</mark> atccaacctgagtgggcctct	gcttctgcccaagaagctgggaaaatggcaccagttgctgggagcgcaggtgcaagaatc	Marmoset	aagttccaagatgtctcctttgcatatcccagtcgccctgacaagcctgtgcttaagggg
Galago	ccaaacaggtgccatcacat <mark>ctcgggtaacagaggacac</mark> gtccaccctaagtgagtctct	$\tt cottetgectaagaagetgggaaaatggtaecagteaetggeggtgeaggtgeageaate$	Galago	gagttccaggatgtcttctttgcatatcccaaccgccctgaccagcctgtgctcaagggg
	***.*****. *************************	*******.******* * *****.***.***.*.******** .*.******		.*.*****.**.****.**********************
				Forward Prime
Human	gagtgagaatctgagcttatttctgtggtacctggtgcgaggcctatgtctcttggggat	totggcaaag <mark>tccagccaggtggc</mark> cattgaggtcctgtcggccatgcctacagttcgaag	Human	ctgacgtttaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Gorilla	gagtgagaatctgagcttatttctgtggtacctggtgcgaggcctatgtctcttggggat	tetggeaaag <mark>teeageeaggtgge</mark> eattgaggetetgteggeeatgeetaeagttegaag	Gorilla	ctgacgtttaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Bonobo	gagtgagaatctgagcttatttctgtggtacctggtgcgaggcctatgtctcttggggat	tctggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgcctacagttcgaag	Bonobo	ctgacgtttaccctacgtcctggtgaggtgacggcactggtgggacccaatgggtctggg
Chimpanzee	gagtgagaatctgagcttatttctgtggtacctggtgcgaggcctatgtctcttggggat	totggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggctatgcctacagttcgaag	Orangutan	ctgacgttcaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Orangutan	gagtgagaatctgagcttatttctgtggtacgtggtgcgaggcctatgtctcttggggat	totggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgcctacagttcgaag	Baboon	ctgacgttcaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Gibbon	gagtgagaatctgagcttatttctgtggtacctggtgcgaggcctatgtctcttggggat	tctggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgcctacggttcgaag	Cynomolgus	ctgacgttcaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Cynomolgus	gagtgagaatctgagcttatttctgtggtacctggttcgaggcctatgtctcttggggat	tctggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcagccatgcctacagttcgaag	Vervet	ctgacattcactctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctgg
Rhesus Macaque	gagtgagaatctgagcttatttctgtggtacctggttcgaggcctatgtctcttggggat	totggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgcctacagttcgaag	Rhesus Macaque	ctgacgttcaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Vervet	gagtgagaatctgagcttatttctgtggtacctggttcgaggcctatgtctcttggggat	totggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgcctacagttcgaag	Gibbon	ctgacgttcaccctacgtcctggtgaggtgacggcgctggtgggacccaatgggtctggg
Baboon	gagtgagaatctgagcttatttctgtggtacctggttcgaggcctatgtctcttggggat	tctggcaaag <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgcctacagttcgaag	Chimpanzee	ctgacgtttaccctacgtcctggtgaggtgacggcactggtgggacccaatgggtctggg
Marmoset	gagtgggaatctgagctcacttctgtggtacctggtgcgaggcatgtgtctcttggggat	tctggcaaaa <mark>tccagccaggtggc</mark> cattgaggctctgtcggccatgtctacggttcgaag	Squirrel Monkey	ctgacgttcaccctacgtcctggcgaggtgacagcgctggtgggacccaatgggtctggg
Squirrel Monkey	gagtgagaatctgagcttatttatctggtacctggtgcgaggcatgtgtctcttggggat	totggccaag <mark>tccagccaggtggc</mark> cattgaggctctgtcagccatgtctacagttcgaag	Marmoset	ctgacgttcaccctacgtcctggtgaggtgacagcgctggtgggacccaatgggtctggg
Galago	gagtgagaagctgagcctactgctgtggtacctggtgcgaggactgtgtctcttggcgtt	tetggeagag <mark>tecagecaggtgge</mark> egttgaggetetgteageeatgeeeaeagteeggag	Galago	ctgacattcaccctacgtcctggtgaggtgacagcgctggtgggacccaatgggtctggg
	****.*** *******.* * ****** **** ***** *.****	****** .*.* <u>***************************</u>		*****.**.**.***************************
		Reverse Primer		
Human	catgetetgggggateagtgteeeteaceatggteaceetggteaceetgeetetgetttt		Human	aagagcacagtggctgccctgctgcagaatctgtaccagcccacagggggaca
Gorilla	catgetetgggggateagtgteeeteaceatggteaceetggteaceetgeetetgetttt		Gorilla	aagagcacagtggctgccctgctgcagaatctgtaccagcccacaggcggaca
Bonobo	catgetetggggateagtgteeeteaceatggteaccetggteaceetgetetget		Bonobo	aagagcacagtggctgctctgctgcagaatctgtaccagcccacaggcggaca
Chimpanzee	catgetetgggggateagtgteeeteaceatggteaceetggteaceetgeetetgetttt		Orangutan	aagagcacagtggctgccctgctgcagaatctgtaccagcccacagggggaca
Orangutan	catgetetgggggateagtgteeeteaceatggteaceetggeeaceetgeetetgetttt		Baboon	aagagcacagtggctgccctgctgcagaatctgtaccagcccaccgcgggaca
Gibbon	catgetetggggateagtgteeeteaceatggteaccetggteaceetgetetget		Cynomolgus	aagagcacagtggctgccctgctgcagaatctgtaccagcccaccgcgggaca
Cynomolgus	catgctctgggggtcagtgtccctcaccatggtcaccctggtcaccctgcctctgctttt		Vervet	aagagcacagtggctgccctgctgcagaatctgtaccagcccaccgcgggaca
Rhesus Macaque	catgctctgggggtcagtgtccctcaccatggtcaccctggtcaccctgctttt		Rhesus Macaque	aagagcacagtggctgccctgctgcagaatctgtaccagcccaccgcgggaca
Vervet	catgctctgggggtcagtgtccctcaccatggtcaccctggtcaccctgctttt		Gibbon	aagagcacggtggctgccctgctgcagaatctgtaccagcccacagggggaca
Baboon	catgctctgggggtcagtgtccctcaccatggtcaccctggtcaccctgctttt		Chimpanzee	aagagcacagtggctgctctgctgcagaatctgtaccagcccacaggcggaca
Marmoset	catgctctgggagtcagtgcccctcaccatggtcaccctggtggccctgcctctgctttt		Squirrel Monkey	aagagcacagtggctgccctactgcagaatctgtaccagcccacaggggggaca
Squirrel Monkey	catgetetggggggteagtgecceteaceatggteaceetggtegeeetgeetetgetttt		Marmoset	aagagtacagtggctgccctactgcagaatctgtaccagcccacaggggnnnnnnnaat
Galago	catgctctgggggtcactgtccctcaccatggttaccctggttgccctgcctctgctctt		Galago	aagagcacgatggctgccctgctgcagaatctgtaccagcccacaggggggaca
	***************************************		-	***** ** ** ****** ** ** **************

Reverse Primer

**Supplemental Figure 10.** *TAP1* and *TAP2* primer sequences. Sequence homology was determined through comparisons of primate sequences available on NCBI. These included: Humans (*Homo sapiens*), Gorilla (*Gorilla gorilla*), Chimpanzee (*Pan trogloytes*), Bonobo (*Pan paniscus*), Orangutan (*Pongo abelii*), Gibbon (*Hylobatus leucogenys*), Rhesus Macaque (*Macaca mulatta*), Cynomolgus (*Macaca fascicularis*), Baboon (*Papio anubis*), Squirrel monkey (*Saimiri boliviensis*), Vervet(*Chlorocebus sabaeus*), Marmoset (*Callithrix jacchus*) and Galago (*Otolemur garnettii*). The set of species for which mRNA data was available was not consistent between genes. The Tarsier (*Tarsius syrichta*) sequence was not included as none of the primate species assayed in this paper were found on that branch of the primate phylogeny. The "\*" symbol was used to represent nucleotides that are completely conserved between the species assayed.

# $\beta$ -2 microglobulin partial mRNA sequence

#### Forward Primer

Human	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ccgacattgaagttgacttactgaagaatggagag
Gorilla	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ccgacattgaagttgacttactgaagaatggagag
Orangutan	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ccgacattgaagttgacttactgaagaatggagag
Chimpanzee	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ccgacattgaagttgacttactgaagaatggagag
Gibbon	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ccgatattgaagttgacttgctgaagaatggaaag
Marmoset	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ctgacattgaagttgacttactgaagaatggaaag
Tamarin	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	tetgacattgaagttgaettaetgaagaatggaaag
Squirrel Monkey	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	tetgacattgaagttgaettaetgaagaatggaeag
Rhesus Macaque	tgeta	<mark>tgtgtctgg</mark> a	tttcatcca	<mark>t</mark> ctgatattgaagttgacttactgaagaatggagag
Baboon	tgeta	tgtgtctggg	, <mark>tttcatcca</mark>	<mark>t</mark> ctgatattgaagttgacttactgaagaatggagag
Cynomolgus	tgeta	<mark>tgtgtctgg</mark> a	tttcatcca	<mark>t</mark> ctgatattgaagttgacttactgaagaatggagag
Vervet	tgeta	tgtgtctggg	tttcatcca	tetgatattgaagttgaettaetgaagaatggagag
Galago	tgeta	tgtgtctgga	tttcatcca	tctgacattgatattaccatgttaaagaatggaaag
_	*****	********	*******	** ** ***** ** * * * * * * ************

Human	agaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Gorilla	agaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Orangutan	agaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Chimpanzee	agaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Gibbon	aaaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Marmoset	aaaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Tamarin	aaaattgaaaaag	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Squirrel Monkey	aaaattgaaaacg	tggagcat	tcagact	tgtcttt	cagcaaggactggtctttctatctc
Rhesus Macaque	aaaatgggaaaag	tggagcat	tcagact	tgtcttt	cagcaaagactggtctttctatctc
Baboon	aaaatgggaaaag	tggagcat	tcagact	tgtcttt	cagcaaagactggtctttctatctc
Cynomolgus	aaaatgggaaaag	tggagcat	tcagact	tgtcttt	cagcaaagactggtctttctatctc
Vervet	aaaatggggaaag	tggagcat	tcagact	tgtcttt	cagcaaagactggtctttctatctc
Galago	aagatagaaaagg	tggagcag	g <mark>tcagact</mark>	tgtcttt	ccacaaggactggtctttctatgtg
	*** *** *	******	******	******	* ******************

#### Reverse Primer

**Supplemental Figure 11.** β-2 microglobulin primer sequences. Sequence homology was determined through comparisons of primate sequences available on NCBI. These included: Humans (*Homo sapiens*), Gorilla (*Gorilla gorilla*), Orangutan (*Pongo abelii*), Chimpanzee (*Pan trogloytes*),, Gibbon (*Nomascus leucogenys*), Marmoset (*Callithrix jacchus*), Tamerin (*Saguinus midas*), Squirrel monkey (*Saimiri boliviensis*), Rhesus macaque (*Macaca mulatta*), Baboon (*Papio anubis*), Cynomolgus (*Macaca fascicularis*), Green monkey (*Chlorocebus sabaeus*), and Galago (*Otolemur garnettii*). The set of species for which mRNA data was available was not consistent between genes. The Tarsier (*Tarsius syrichta*) sequence was not included as none of the primate species assayed in this paper were found on that branch of the primate phylogeny. The "\*" symbol was used to represent nucleotides that are completely conserved between the species assayed.



**Supplemental Figure 12.** Scatterplot showing standardized contrast analysis for (A) ATP-independent proteolytic activity. (B) *PSMB8* mRNA. (C) *INFGR2* mRNA. (D) IFN-γ induced change in LD50. Values are calculated as described in *Garland et al., 1994* and are based on the phylogeny in *Pickering et al., 2014* (Note N = N - 1 of original results due to the pairwise comparisons involved in the phylogenetic contrast)

Garland T, Adolph SC. Why Not to Do 2-Species Comparative-Studies - Limitations on Inferring Adaptation. Physiol Zool. 1994 Jul-Aug;**67**(4):797-828. Pickering, A. M., Lehr, M., Kohler, W. J., Han, M. L. & Miller, R. A. (2014) Fibroblasts From Longer-Lived Species of Primates, Rodents, Bats, Carnivores, and Birds Resist Protein Damage. J Gerontol A Biol Sci Med Sci, doi:10.1093/gerona/glu115.



**Supplemental Figure 13.** Scatterplot of mass-adjusted changes in (A) ATP-independent proteolytic activity. (B) *PSMB8* mRNA. (C)  $Log_{10}$  *INFGR2* mRNA. (D) IFN- $\gamma$  induced change in LD50. Values represent the residual from either maximum lifespan, or the variable of interest, plotted against  $log_{10}$  (mass) (g).



**Supplemental Figure 14. (A)** Scatterplot of cell passage number against maximum lifespan. Error bars if present show the highest and lowest passage number used for this cell line. **(B)** Scatterplot of donor animal age against maximum lifespan. (C) Scatterplot of donor animal age (as a fraction of maximum lifespan) against maximum lifespan. Error bars if present show the highest and lowest age of donor animals used. Each data point represents an independent species. Humans are shown with an 'H' but are excluded from analyses.



**Supplemental Figure 15.** Assessment of cellular endpoints after removal of data from Mouse Lemur, Noisy Douroucouli, Patas Monkey and Woolly Monkey, the four species for which donor age exceeded 50% of species maximum lifespan. The association of MLS with these endpoints is replicated in this truncated set of species, although in one case the association no longer reaches the standard criterion for statistical significance (PSMB8 mRNA, p = 0.07).



**Supplemental Figure 16.** PSMB5 levels in liver samples of mice subjected to a variety of life-extending interventions. (**A**) Rapamycin. (**B**) NDGA. (**C**) 17- $\alpha$ -Estradiol. (**D**) Snell dwarf. Data are presented as bar graphs of PSMB5 levels adjusted to  $\beta$ -actin. Data are plotted as a percent of control males. Error bars represent SEM where N = 4 (except for Snell dwarfs where N = 6). For rapamycin, NDGA, and 17- $\alpha$ -estradiol, controls were littermates that received mouse chow with no drugs. For the Snell dwarf study, controls were littermates.